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Assessment of Level 2B Lymph Nodes Involvement in Various Oral Squamous Cell Carcinomas

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Abstract: ***The decision to include level IIb lymph node dissection during surgical management of oral squamous cell carcinoma (OSCC) remains a topic of nuanced debate, especially considering the anatomical challenges and potential complications. This prospective observational study, involving 45 patients with operable OSCC, set out to assess whether routine dissection of level IIb lymph nodes is justified. Interestingly, only 6.6% of the cases showed metastatic involvement in this region, a figure closely aligned with previous literature. Most of these positive cases were associated with tongue carcinomas in advanced stages (T3), highlighting the unique lymphatic pathways of the tongue. It is evident that level IIb involvement often accompanies level IIa metastasis, yet no consistent correlation was observed in this study. This raises another point: should every patient undergo this technically demanding dissection when the yield is so low? The findings suggest a more selective approach may be warranted—particularly omitting level IIb dissection when level IIa nodes are uninvolved—thereby reducing surgical trauma, especially to the spinal accessory nerve. Ultimately, this research advocates for tailored surgical strategies that prioritize oncological safety without compromising functional outcomes.***

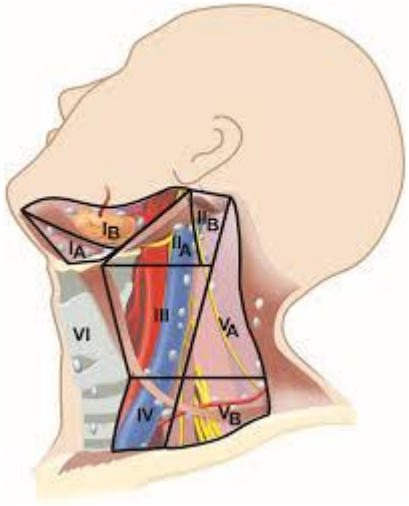
Keywords: oral squamous cell carcinoma, level IIb dissection, cervical lymph nodes, tongue cancer, surgical complications

1. Introduction

1) Globally, oral cancer is the sixth most common type of cancer with India contributing to almost one - third of the total burden. [1] It is most common among males with age standardised incidence rate of 14.8 [2]
2) It metastasizes through lymphatic vessels to cervical lymph nodes. [2]
3) Therefore, neck dissection plays an important role in management of oral cancers
4) There are various types of neck dissections from radical to selective neck dissections. But surgeons are nowadays desirable to perform the least radical surgical approach to avoid further complications.
5) Posterior region of cervical level II, which is called level IIb, is technically more challenging for surgeons and puts patients at a higher risk because of its crucial anatomic position, difficult accessibility, and important anatomic contents.

Table 14-2: Types of neck dissection

Type of neck dissection	*Nodes removed*	*Structures preserved*
Comprehensive –		
Radical neck dissection (RND)	Level I-V	None
MRND type I	Level I-V	Spinal accessory nerve
MRND type II	Level I-V	Spinal accessory nerve; sternomastoid muscle
MRND type III	Level I-V	Spinal accessory nerve; sternomastoid muscle; IJV
Bilateral RND	Level I-V (both sides)	
Selective node dissection –		
Supraomohyoid neck dissection (N_0)	Level I-III	Spinal accessory nerve; sternomastoid muscle; IJV
Extended supraomohyoid dissection (N_0)	Level I-IV	Spinal accessory nerve; sternomastoid muscle; IJV
Anterolateral neck dissection ($N_{0)}$	Level II-IV	Spinal accessory nerve; sternomastoid muscle; IJV
Posterolateral neck dissection (N_0)	Level II-V with suboccipital, retroauricular nodes	Spinal accessory nerve; sternomastoid muscle; IJV
Anterior/central dissection	Level VI	Spinal accessory nerve; sternomastoid muscle; IJV



6) Adequate dissection of level IIb lymph nodes may lead to various problems.
   a) Injury to spinal accessory nerve
   b) Difficulty at overhead abduction of shoulder joint
   c) Frozen shoulder

7) Therefore, the purpose of this study is to clarify whether level IIb dissection should be performed or not in the treatment of OSCC by analyzing the frequency of metastases in this given nodal group.

Aims -
The aim of this study is to clarify whether level IIb dissection should be performed or avoided in the treatment of oral squamous cell carcinoma

Objectives:
To assess the results of positivity of level 2B nodes in various oral squamous cell carcinomas

Research Question:
Is level llB lymph node dissection really necessary for all oral squamous cell carcinomas?

Inclusion Criteria
a) All diagnosed cases of various oral squamous cell carcinoma
b) All diagnosed cases of operable oral SCC.

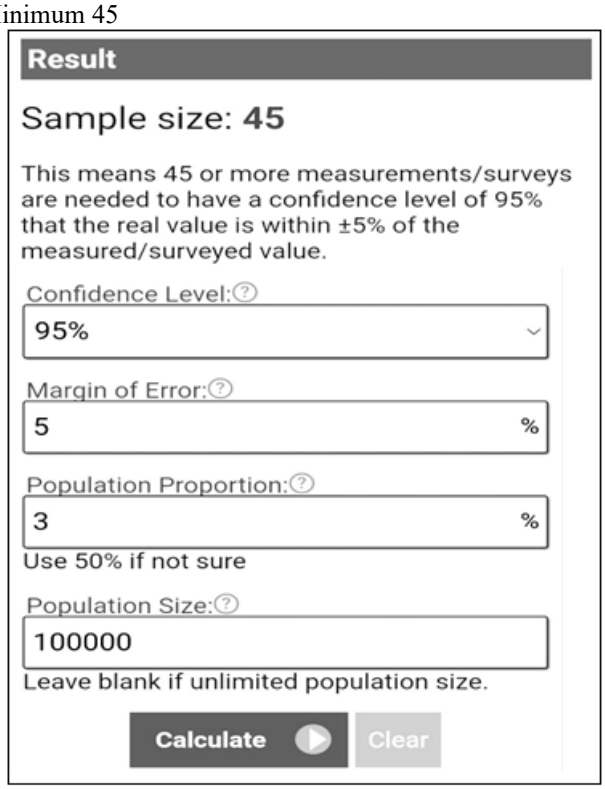
Exclusion Criterias
a) Patients who had taken neoadjuvant chemo/radiotherapy
b) Patients who had relapse
c) Patients not willing to be part of the study

2. Material and Methods

45 newly diagnosed oral cavity carcinoma patients attending outpatients department of surgery of DVVPF's Medical College and Hospital requiring surgery as the primary treatment were included in this study. Preoperative examinations with clinical TNM classification were noted. Any clinical level 2B involvement was documented. After taking informed consents, patients were subjected to appropriate surgical plan accordingly. Intraoperatively, level 2B nodes were dissected and sent separately. Histopathological TNM staging and positivity of level 2B lymph nodes are noted.

Study type
Prospective observational study
Sample size

Minimum 45



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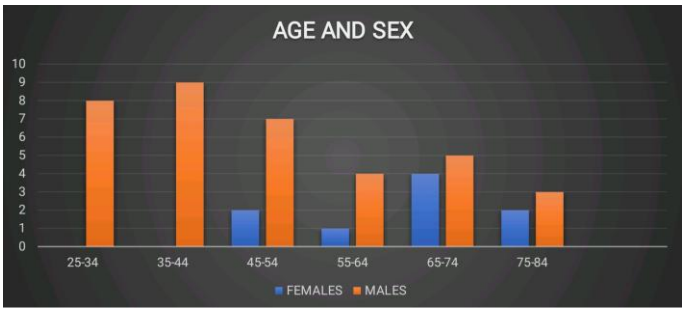
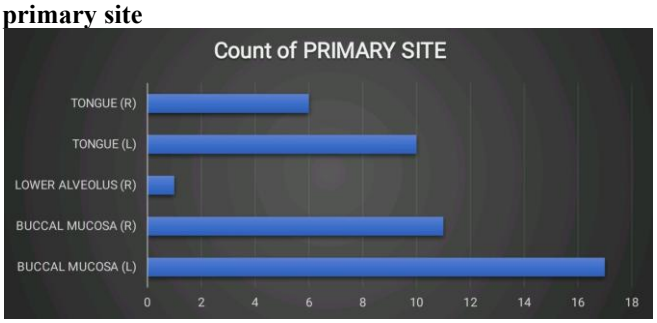
Study population
All histologically proven oral cavity squamous cell carcinomas requiring surgery as primary treatment.

Statistical analysis
Analysis according to age and sex of the patients.

Age Group	Females	Males	Total
25- 34	0	8	8
35- 44	0	9	9
45- 54	2	7	9
55- 64	1	4	5
65- 74	4	5	9
75- 84	2	3	5
Total			45



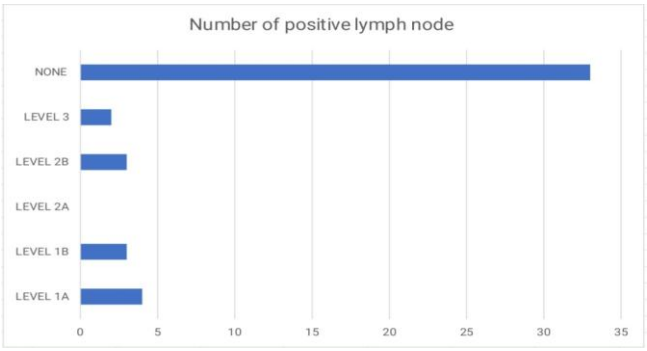
Distribution of cases according to involvement of primary site



Primary Site of Involvement	Total Cases
Left Buccal Mucosa	17
Right Buccal Mucosa	11
Right Lower Alveolus	1
Left Tongue	10
Right Tongue	6

Involvement of cervical lymph nodes according to histopathological levels.

Level of Lymph Nodes	Number of cases in which lymph nodes are positive
Level 1A	4
Level 1B	3
Level 2A	0
Level 2B	3
Level 3	2
None	33



According to histopathological T and N stage

Pathological T Stage	Number of Cases
T1	0
T2	6
T3	5
T4a	1

Pathological N Stage	Number of Cases
N0	3
N1	6
N2	3

Involvement of Level 2B LN	Pathological TNM	Clinical TNM	Diagnosis
+	T2N2	T2N2	Rt Ca tongue
+	T3N2	T3N2	Left Ca buccal mucosa
+	T3N1	T3N1	Rt Ca tongue

1) Out of 3 cases of metastatic level 2B LN, two cases are of Carcinoma tongue.
2) Out of 3 cases of metastatic level 2B LN, two cases are of advanced stages (T3)
3) Out of 3 cases of metastatic level 2B LN, all cases have clinical cervical lymphadenopathy.

3. Discussion

1) In our prospective study, it analysed the incidence of lymph node metastases to level 2B.
2) Our analysis suggested that 33 patients were negative for nodal metastasis. Metastasis to lymph nodes were found in only 12 patients. (26.6%)
3) Lim et al. reviewed 74 patients with a clinically lymph node - negative neck who underwent neck dissection for oral cavity SCC and found a prevalence of metastases at level IIb in 5% of cases [4] Elsheikh et al. found an incidence of 10% at level IIb lymph nodes [5]. In our study, level IIb lymph node involvement was around 6.6%, similar to that in the available literature**.**
4) de Vicente et al. [6], and Maher et al. [7] reported the incidence of IIb lymph node to be around 5 - 6% in tongue cancer cases. Our study 2 out of 16 tongue cancer cases had level 2B involvement which is 12.5%.
5) Out of 3 cases of level 2B lymph nodes involvement, two cases were of tongue carcinoma. This explains rich and peculiar lymphatic drainage, of the tongue, through which carcinoma primarily metastasizes to level 2B lymph nodes.
6) In current literature, involvement of level 2B lymph nodes usually follows level 2A involvement. But there was no significant association that 2B lymph nodes were more commonly positive in positive 2A lymph nodes compared to negative 2A lymph nodes, considering the low positivity rate, the dissection of level 2B nodes could be omitted if the level 2A lymph nodes are negative as it will provide a significant decrease in operative time and less of SAN trauma - related complications.

4. Conclusion

1) All visible nodes in the submuscular triangle (level 2B) are not metastatic nodes.
2) Dissection in this subgroup may be done in selected groups having tongue carcinoma, at late stages (T3, T4), or when level 2B are involved.
3) Preserving level 2B lymph nodes in selected cases can potentially decrease the operative time and reduce the risk of SAN injury - related complications.

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